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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/955,216	09/19/2001	Sherri M. Brown	16517.257	1690

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EXAMINER	
SHEINBERG, MONIKA B	
ART UNIT	PAPER NUMBER
1634	

DATE MAILED: 09/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/955,216	BROWN ET AL.	
	Examiner	Art Unit	
	Monika B Sheinberg	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

P riod for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *8 and 10-19* is/are pending in the application.

4a) Of the above claim(s) *8,11-16,18 and 19* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *10 and 17* is/are rejected.

7)☒ Claim(s) *17* is/are objected to.

8)☒ Claim(s) *8 and 10-19* are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4 sheets* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *Detailed Action* .

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of Group II (claims 10-19) and nucleic acid sequence election of SEQ ID NO: 7; in the response filed: 12 June 2003, is acknowledged. The traversal is on the ground(s) that it would not be a serious search burden on the Examiner to search Group I and II together as well as at least ten nucleotide sequences, disagreeing that "each nucleotide sequence in the application is necessarily a patentably distinct species" (response, p. 2, 3rd paragraph). This is not found persuasive because the inventions are distinct for the reasons given in the previous Office action; the product (the nucleic acid) as claimed can be used in a materially different process of using that product (M.P.E.P. 806.05(h)). As stated in the mailed restriction, the nucleic acids of Group II can be used in the distinct process of the invention of Group I, or alternatively, the nucleic acids of Group II can be used in antisense therapy, polypeptide expression, and screening via nucleic acid binding reactions, all of which are also a clearly distinct usage of such nucleic acids. In addition, a search of the nucleic acid composition would not be representative of a full search of the method claim.

The requirement is still deemed proper and is therefore made FINAL. Applicants are reminded that the claims must be amended to reflect the instant election.

- Claims 8, 11-16, 18 and 19 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the response filed: 12 June 2003.
- Claims 8 and 10-19 are pending.
- Claims 10 and 17 are hereby examined.

Please note that a claim 10 was not provided previously thus the previously added claims 11-20 were renumbered to 10-19 accordingly. Therefore the claims currently pending are claims 8 and 10-19. For clarification, the claims under examination are claims 10 and 17 with respect to SEQ ID NO: 7 are the following:

10. An isolated nucleic acid molecule comprising a nucleic acid sequence selected from the group consisting of SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 3, SEQ ID NO: 4, SEQ ID NO: 5, SEQ ID NO: 6, SEQ ID NO: 7, SEQ ID NO: 9, and SEQ ID NO: 10.
17. The isolated nucleic acid molecule according to claim 10, wherein said isolated nucleic acid molecule comprises a nucleic acid sequence of SEQ ID NO: 7.

Priority

Applicant's claim for domestic priority under 35 U.S.C. 119(e) and 120 to numerous listing of applications. Applicants are requested to provide page and line numbers for support of priority from the numerous applications listed that provide adequate support under 35 U.S.C. 112 with respect to SEQ ID NO: 7 of this application for priority under 35 USC § 119 (e) and 120. In addition, if the application from which priority is claimed, please indicate whether there is a computer readable format of the Sequence Listing. Examiner has found support for SEQ ID NO: 7, in application number 09/252,974 (SEQ ID NO: 7) therefore, the priority date of the instant application is therefore considered to be February 19, 1999.

Claim Rejections - 35 USC § 101 and 112

The pending claims have been reviewed in light of the Utility Examination Guidelines and Guidelines for Examination of Patent Applications under 35 U.S.C. 112, first paragraph, "Written Description" Requirement, Federal Register, Vol. 66, No. 4, pages 1092-1111, Friday, January 5, 2001.

The examiner is using the following definitions in evaluating the claims for utility.

"Specific" - A utility that is *specific* to the subject matter claimed. This contrasts with a *general* utility that would be applicable to the broad class of the invention.

"Substantial" - A utility that defines a "real world" use. Utilities that require or constitute carrying out further research to identify or reasonably confirm a "real world" context of use are not substantial utilities.

"Credible" - Credibility is assessed from the perspective of one of ordinary skill in the art in view of the disclosure and any other evidence of record that is probative of the applicant's assertions. That is, the assertion is an inherently unbelievable undertaking or involves implausible scientific principles.

"Well-established" - a specific, substantial, and credible utility which is well known, immediately apparent, or implied by the specification's disclosure of the properties of a material, alone or taken with the knowledge of one skilled in the art.

35 U.S.C. § 101

> "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title".

- Claims 10 and 17 are rejected under 35 U.S.C. § 101 because the claimed invention lacks patentable utility due to its not being supported by a substantial utility.

The claims are drawn to an isolated nucleic acid molecule comprising a nucleotide sequence of SEQ ID NO: 7. The specification generally teaches identification of sequences (such as SEQ ID NO: 7) by subtractive library hybridization techniques (example 2, p. 207). The specification teaches that SEQ ID NO: 7 was identified from library CMz031 (Lib148) (Table A and p. 170). The specification teaches that the library-designated CMz031 was CDNA prepared from maize pollen tissue at a particular developmental stage (V10+, p. 170). The specification asserts that SEQ ID NO: 7 encodes a "maize or soybean copalyl diphosphate synthase enzyme or fragment thereof" (p. 16, lines 15-17) thereby be useful to identify and obtain homologues in both maize and non-maize plants (p. 42-43, line 20 to line 4 respectively).

The asserted specific utilities are based upon homology/identity to experimentally known sequences of the cDNA; kaurene synthase A (gi576885, 03-Aug-1995; Table A and p. 42) also known as ent-kaurene sythnase. Please note that the specification asserts different enzymes to the single elected sequence by database sequence alignments; first to copalyl diphosphate synthase enzyme and second to the accession number gi576885 - which is entered to be a kaurene synthase A. Thus the elected sequence is asserted to be at leasat two different enzymes with different functions of the gibberellin pathway. Thus the specification discloses uncertainty as to which utility should be asserted to the instant nucleic acid.

It is noted that applicant(s) have listed this sequence which is known in the prior art and which has a high percentage sequence similarity (95%, table A) to a claimed sequence, SEQ ID NO: 7. It is known for nucleic acids as well as proteins, for example, that even a single nucleotide or amino acid change or mutation can destroy the function of the biomolecule in

many instances, albeit not in all cases. The effects of these changes are largely unpredictable as to which ones have a significant effect versus not. Therefore, the citation of sequence similarity results in an unpredictable and therefore unreliable correspondence between the claimed nucleotide and the indicated similar nucleotides of known function and therefore lacks support regarding utility and/or enablement. Several publications document this unpredictability of the relationship between sequence and function, albeit that certain specific sequences may be found to be conserved over polypeptides of related function upon a significant amount of further research. See the following publications that support this unpredictability as well as noting certain conserved sequences in limited specific cases: Gerhold *et al.*[*BioEssays*, vol. 18, n. 12, pp. 973-981(1996)]; Wells *et al.*[*J. Leukocyte Biol.*, vol. 61, n. 5, pp. 545-550 (1997)]; and Russell *et al.*[*J. Molecular Biol.*, vol. 244, pp. 332-350 (1994)].

Further, it is unpredictable if SEQ ID NO: 7 will successfully encode a functional enzyme in that it is not indicated to be a full-length open reading frame. The elected sequence is not disclosed as a full-length open reading frame of the synthase that it is predicted to encode. As per the specification the claimed sequences are "randomly selected clones [that] comprise insets that **can** represent a copy of **up to** the full length of a mRNA transcript" (emphasis added). In addition, it unclear as what function is asserted since SEQ ID NO: 7 after review of the links to database entries is associated the function of kaurene sythase A, where as Table A and the disclosure describes it to be copalyl diphosphate synthase. With respects to nucleic acid homologues to the enzyme of interest, the results of identification, detection, isolation using the nucleic acid fragment as disclosed in SEQ ID NO: 7 would be unpredictable due to lack certainty of which enzyme homologue is actually targeted; as seen in the specification's own uncertainty, but also due to lack of predictability in homology. The potential specific utility of the enzyme is determined by sequence characteristic prediction and not by experimentation; no actual enzyme with a defined functionality or biological activity is disclosed thus no certainty in having a useful isolated product with which to perform the potential assays to study/modify the gibberellin pathway. The specification asserts that the nucleic acid would encode polypeptide compounds, proteins, that may be useful in a variety functional/biological activities based on a correspondence of similarity to a known protein.

In addition, the nucleic acid is not supported by a substantial utility because no substantial utility has been established for the claimed subject matter. For example, the nucleic acid is not experimentally characterized in any fashion, but partially characterized by predictions based on homology analyses to public database entries. The research contemplated by applicant(s) to characterize the nucleic acid or potential enzyme products, especially their biological activities, does not constitute a specific and substantial utility. Identifying and studying the properties of a nucleic acid, its potential enzyme product or the mechanisms in which the enzyme is involved does not define a "real world" context or use. Thus the insubstantial utility of the provided sequence of record constitutes carrying out further research to identify or reasonably confirm the utility of the provided sequence, SEQ ID NO: 7.

35 U.S.C. § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

- Claims 10 and 17 are also rejected under 35 U.S.C. § 112, first paragraph. Specifically, since the claimed invention is not supported by a substantial utility for the reasons set forth above, one skilled in the art would not know how to use the claimed invention.

- Claims 10 and 17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The specification discloses SEQ ID NO: 7, asserted to encode a copalyl diphosphate synthase. The full-length exact sequence of SEQ ID NO: 7 per se, meets the written description provisions of 35 USC 112, first paragraph. However, the claims are directed to encompass gene sequences of any magnitude and/or content comprising SEQ ID NO: 7 or of SEQ ID NO: 7; a genus that is extremely large while that which is disclosed is a single sequence, SEQ ID NO: 7 in the

Sequence Listing which is not representative of this large genus. (Applicants are reminded that the specification is uncertain and inconsistent with that which is representative SEQ ID NO: 7). Therefore the specification does not teach the large genus that is encompassed by the claim. These sequences correspond to sequences from other species, mutated fragment sequences, allelic variants, splice variants, and so forth. None of these additional sequences meet the written description provision of 35 USC 112, first paragraph. The specification provides insufficient written description to support the genus encompassed by the claim. This is a rejection based on a lack of WRITTEN DESCRIPTION.

The following is a quotation of the **second** paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

- Claims 10 and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 10 and 17 are vague and indefinite due to the lack of clarity of the phrase "comprises a nucleic acid sequence of SEQ ID NO: 7" as seen in claim 17 line 2. It is unclear as to which nucleic acid sequence of the elected sequence is required to be comprised within the claimed isolated sequence. Currently, the claim reads on any sequence that contains at least 2 contiguous nucleotides of SEQ ID NO: 7. Thus it is unclear what is intended by the applicants to meet the limitations of the claim due to metes and bounds of the parameters that define a nucleic acid sequence of SEQ ID NO: 7.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

- Claims 10 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by GenBank accession number L37750 (gi 576885; 03-Aug-1995).

The GenBank accession number L37750 (gi 576885; 03-Aug-1995) comprises a sequence greater than 150 contiguous nucleotides of SEQ ID NO: 7. Thus the instant sequence of accession number L37750 anticipates the requirements of the claims wherein the "nucleic acid sequence comprises a nucleic acid sequence of SEQ ID NO: 7" (claim 17).

- Claims 10 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by products O1256 and O4378 of the 1993 Sigma Chemical Catalog.

In The 1993 Sigma Chemical Catalog product O1256 is a 4-mer oligonucleotide of poly dT nucleotides and product O4378 is a 4-mer oligonucleotide of poly dA nucleotides. It is noted that these oligonucleotides are fragments in length that are encompassed by the instantly claimed nucleic acids. They thus anticipate instant claims via segments therein which are poly T segments or poly A segments present in the SEQ ID NO: 7 (nucleic acid positions 169-171 and 81-84 respectively).

Claim Objection

- Claim 17 objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 17 is equivalent to claim 10 as directed to the elected sequence, SEQ ID NO: 7.

Specification Objection

- The disclosure is objected to because it contains embedded hyperlinks and/or other form of browser-executable code. Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code in the specification in the following place: (a) page 10, lines 10-18; and (b) page 12, line 10 - page 13, line 3. See MPEP § 608.01.

Conclusion

- Claims 10 and 17 are rejected under 35 U.S.C. 101 – utility.
- Claims 10 and 17 are rejected under 35 U.S.C. 112, first paragraph – enablement.
- Claims 10 and 17 are rejected under 35 U.S.C. 112, first paragraph – written description.
- Claims 10 and 17 are rejected under 35 U.S.C. 112, second paragraph.
- Claims 10 and 17 are rejected under 35 U.S.C. 102 (b) as anticipated by GenBank accession number L37750.
- Claims 10 and 17 are rejected under 35 U.S.C. 102 (b) as anticipated by products O1256 and O4378 of the 1993 Sigma Chemical Catalog.
- Claim 17 objected to under 37 CFR 1.75(c).
- Specification objection – embedded hyperlinks.

No claim is allowed.

Inquiries

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993) (See 37 CFR § 1.6(d)). The CM1 Fax Center number is (703) 308-4242.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monika B. Sheinberg, whose telephone number is (703) 306-0511. The examiner can normally be reached on Monday-Friday from 9 A.M to 5 P.M. If attempts to reach the examiner by telephone are unsuccessful, the primary examiner in charge of the prosecution of this case, Jehanne Souaya, can be reached at 703-308-6565. If attempts to reach the examiners are unsuccessful, the examiner's supervisor, Gary Benzion, can be reached on (703) 308-1119.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to Patent Analyst, Chantae Dessau, whose telephone number is (703) 605-1237, or to the Technical Center receptionist whose telephone number is (703) 308-0196.

September 8, 2003
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